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## Fractional Efficiency Testing of Air Filters

Status: Accepted

Category: 2 Filter Testing

Tim Johnson

*TSI Incorporated, Shoreview, MN, United States*

One of the defining characteristics of filter media is the filter efficiency. The probability of a particle passing through a filter media is primarily a function of particle size. For every filter, a penetration curve of particle size versus percent penetration can be used to determine the Most Penetrating Particle Size (MPPS) of the filter-the particle size at which the filter is the least efficient. By challenging the filter with a test aerosol at a number of particle sizes the shape of this curve can be determined and the MPPS, the minimum efficiency of filter can be determined. This paper will describe the instruments needed to perform this type of test and several methods that can be used.

The method used to measure filter efficiency can have profound effects on the test results. Depending on the test scheme is chosen, the measured filter efficiency can vary greatly. This paper discusses aerosol filtration basics, fractional efficiency testing, key factors that affect filter efficiency values.

### Bio

Tim Johnson is a Product Specialist in the Particle Instruments group at TSI Incorporated in the USA where he has worked for over 31 years. He supports instruments used in detecting, sizing and measuring concentrations of ultrafine particles in the air and has worked extensively with TSI's line of automated filter testers. Tim has a Bachelors degree in Physics from Macalester College in St. Paul Minnesota.